Small Wind Policy Options

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State policy options can play an essential role in encouraging home and business owners to install small wind energy systems to provide all or a portion of their energy needs. Current policy options include zoning ordinances, utility policies, and financial incentives.

Zoning Ordinances

Many zoning ordinances contain restrictions. Although not intended to discourage the installation of small wind turbines, these restrictions can substantially increase the amount of time and costs required to obtain necessary construction permits. By designating small wind energy systems as a specific permitted use subject to certain requirements, local jurisdictions (counties, cities, townships) can effectively standardize and streamline the process of permitting small wind turbines within their jurisdiction.

Ordinances designating small wind energy systems as a permitted use typically comprise a definition of what constitutes a “small wind energy system”—e.g., listing system components and establishing the maximum rated capacity of systems that may qualify. The definition may also specify that the system be intended primarily to reduce on-site consumption of utility power. The ordinance also defines the requirements such systems must meet. These typically include appropriate height restrictions (which may vary as a function of property size), minimum set-back, maximum noise levels, and compliance with various standards such as the Uniform Building Code, FAA regulations, and the National Electric Code.

EXAMPLES

An example of model zoning ordinance can be found at http://www.awea.org/smallwind/documents/modelzo.html.

Examples of zoning ordinances:

Minnesota
http://www.revisor.leg.state.mn.us/stats/500/30.html.

Montana
http://www.deq.state.mt.us/energy/Renewable/NetMeterRenew.asp.

Nebraska
http://www.ies.ncsu.edu/dsire/library/docs/incentives/NE01R.htm.

Utility Policies

Net Metering

Net metering is an easily administered mechanism for encouraging direct customer investment in renewable energy. Under this policy, electric customers installing their own grid-connected wind turbines would be allowed to interconnect their turbines on a reverse-the-meter basis with a periodic load offset. Under current law in most states, qualifying facilities (QFs) under the Public Utility Regulatory Policy Act (PURPA) and other state-defined renewable generators are allowed to use electricity they generate to offset their simultaneous electricity consumption at their facility. Any excess generation, however, is purchased at a lower wholesale or avoided cost rate, and any excess consumption is purchased at a higher retail rate. This difference can be significant. Net metering allows these customer-generators to "spin the meter backward," using their excess generation to offset retail purchases during other parts of the billing period rather than selling it back at a lower wholesale rate. The customer is billed only for the net electricity consumed over the entire billing period. The effect is to increase the effective value of the excess generation, often by a factor of three to four. In most states with net metering, excess generation beyond what the customer uses to offset consumption during the billing period is sold to the utility at avoided cost or granted back to the utility without payment to the customer.

Net metering generally involves the use of a single, reversible meter—similar to those used by most residential customers and many small commercial and agricultural customers—which usually spins forward to measure electricity flowing from the grid but can also spin backward to measure electricity returned to the grid.

Customer-generators favor net metering because it increases their effective return on investment by allowing them to use excess generation to offset retail purchases rather than sell it at the lower avoided cost price and because it simplifies metering and interconnection requirements. As a form of distributed generation, net metering may offset the need for distribution-line upgrades, a potential economic benefit to the local utility.

From the utility's perspective, the primary justification for net metering is that it eases the administrative burden of handling small, customer-sited generation and reduces the need to read a second meter and issue monthly checks for purchases of small amounts of electricity. Other utilities oppose net metering on principle because it implies paying customers above-wholesale prices for nondispatchable energy (a higher revenue requirement for kWh purchases has traditionally translated into a rate increase for all utility customers). Like energy-efficient appliance purchases, customer efforts to offset load with on-site wind generation reduce electric sales (although if the utility is experiencing load growth in its service territory, this may not be a concern). If measured as an absolute loss of revenue, without any offsetting administrative or accounting savings, the “cost” of net metering to utilities is minimal, even for market penetration several orders of magnitude larger than any state has experienced to date.

Net metering policies historically have been applied to vertically integrated electric utilities in which the same entity that bought and sold power also managed the grid. These functions are likely to be separated as the electric industry is restructured, raising a number of issues about how best to implement net metering. Because distributed resources provide potential benefits to the distribution system, some states have decided it is appropriate to apply net billing policies to distribution companies and to blend any net program costs into distribution service charges. Some states are considering requiring energy service providers, rather than the local distribution utility, to offer net metering. In other states, the arrangement is simplified even further by allowing month-to-month carryover of any net excess generation so that any power produced above what the customer uses is credited to the next monthly bill, rather than sold to the utility. Under this approach, the customer never “sells” energy and the utility (or energy service provider) never “buys” electricity. In any case, the enactment and implementation of net metering laws must be reconsidered in accordance with changes to electric industry structure and regulation (National Wind Coordinating Committee State Policy Options report, pp. 66-68).

EXAMPLES

Model net metering legislation can be found at http://www.awea.org/smallwind/toolbox/IMPROVE/utilities_2a.asp.

Examples of net metering programs:

Iowa
http://www.ies.ncsu.edu/dsire/library/docs/incentives/IA02R.htm.

Massachusetts
http://www.ies.ncsu.edu/dsire/library/docs/incentives/MA01R.htm.

NorthDakota
http://www.ies.ncsu.edu/dsire/library/docs/incentives/ND01R.htm.

Line Extension Policies

Extending electrical transmission and distribution lines to remote, unserved areas is expensive. Line extension costs average about $10 per foot, but they vary substantially depending on the type of line extension and the nature of the terrain.

Utility customers historically have subsidized line extensions for new customer hookups. These subsidies have been rationalized as a means for capturing economies of scale associated with interconnecting greater numbers of customers or as a means for encouraging growth and new construction in urban and rural areas alike. Under most line extension policies, customers are granted a free footage allowance within which the costs are borne entirely by the utility (and ultimately, its customers). Additional subsidies often are available for distances exceeding the free footage allowance.

Line extension subsidies artificially reduce the cost of utility power to new customers, thereby increasing the relative cost of grid-independent or remote power systems, many of which rely upon renewable energy resources such as wind energy. Remote power systems already are cost-effective for many applications—including rural homes and vacation cabins, livestock watering wells, and communications facilities—that are too far from existing power lines to economically justify a line extension (even when partially subsidized). Reducing or eliminating line extension subsidies would result in prices that more accurately reflect actual costs, which in turn would improve the prospects for remote power systems to compete on a direct-cost basis with utility power. At a cost of $10 per foot, for example, reducing a free footage allowance from 1,200 feet to 300 feet shifts $9,000 in costs from utility ratepayers to the individual customer seeking the new hookup. Customers who face substantial increases in the cost of line extensions are more likely to consider remote power systems as an attractive alternative. Thus, changes in line extension policies could result in a significant expansion of the market for remote power systems that use wind and other renewable energy resources.

Other changes to line extension policies could further improve the prospects for use of renewable energy. Related policies that have been proposed or adopted include (1) requiring utilities to provide customers with information regarding remote power systems as an alternative to costly line extensions, and (2) allowing utilities to market, finance, and install remote power systems as an alternative to costly line extensions.

EXAMPLES

A model of a line extension policy can be found at http://www.awea.org/smallwind/toolbox/IMPROVE/utilities_2b.asp.

Examples of line extension policies:

Texas
http://www.puc.state.tx.us/renewable/index.cfm. The Texas Public Utility Commission Web site includes a brochure designed to inform customers of alternatives to line extensions, including wind and solar stand-alone systems, and to provide them with some guidance in assessing whether those alternatives would be appropriate.

New Mexico
http://www.ies.ncsu.edu/dsire/library/includes/tabsrch.cfm?state=NM&type=Line&back=regtab&CurrentPageID=7. Because of New Mexico Public Utility Commission Case Number 2476, electric utilities in the state are required to provide information on alternative energy systems to remote customers with less than a 25-kW load who request line extensions. This requirement applies when the cost of the requested line extension is greater than 15 times the estimated annual revenue from the line extension. In such cases, utilities must provide customers with information on suppliers of alternative energy systems.

Arizona
http://www.ies.ncsu.edu/dsire/library/docs/incentives/AZ04R.htm.

Standard Contracts

Standard, long-term power purchase contracts with predefined interconnection requirements—and perhaps with fixed power purchase rates—could be provided to all sellers of renewable energy that meet certain size, type, and ownership requirements. The application of standard contracts for small and distributed wind systems can simplify negotiations and reduce transaction costs for the selling and purchasing parties, speed the contracting process, improve prospects for project financing, and ensure that all sellers are treated equitably.

This policy would require a determination of contract terms and conditions, including contract length, payment stream, curtailment provisions, and backup power and interconnection requirements. Standard contracts also could include a long-term power purchase rate, but the rate is unlikely to be set high enough to significantly offset investment costs. This is particularly true because the value of self-generation lies in offsetting the retail rate, rather than building an oversized system to sell excess power. But for those systems that do produce excess power, more attractive buyback rates would improve overall economics (NWCC, pp. 66-68).

Interconnection Agreements

Predefined interconnection requirements are a particularly important component of standard contracts for small and distributed wind projects. Utilities historically have been responsible for maintaining the safety and reliability of the grid and have used this responsibility to maintain strict control over the terms and conditions for interconnection to the grid by nonutility generators. Some nonutility generators, however, have alleged that utilities have used their control over interconnection to impose unreasonably strict or unnecessarily expensive requirements for interconnection. For small distributed generators, who have neither the expertise nor the resources to negotiate on an equal footing with the utilities, these requirements can be onerous enough to discourage them from pursuing their projects. The use of standardized interconnection requirements can eliminate the need for individual negotiations, reduce transaction costs, and ensure equitable treatment. The development of predefined interconnection requirements can be simplified by relying on nationally recognized standards such as those developed by the Underwriters Laboratories (UL); Institute of Electrical and Electronic Engineers (IEEE); and the National Fire Protection Association, drafters of the National Electrical Code (NEC) (NWCC, pp. 61-62).

EXAMPLES

For a model of an interconnection agreement, see NARUC's model interconnection procedures/agreement: http://www.nrri.ohio-state.edu/programs/electric/distributedgeneration/data/national/modelfiles/modelprocedures.htm.

Southern Cal/Edison's example of an interconnection agreement:
http://www.sce.com/NR/sc3/tm2/pdf/Rule21.pdf.

Financial Incentives

Investment Tax Credits (Personal Income Tax)

Tax credits for renewable energy projects can support investment by enhancing after-tax cash flows. Historically, investment tax credits (ITC) have been one of the predominant approaches taken at the state and federal levels to stimulate renewable energy development. Specifically, state ITCs can be used to increase wind development by reducing the state income tax burden of wind power investors. The credit allows the investor to reduce its tax obligation by some portion of the amount invested in a wind project. The tax credit can be used in the first year of production, or it can be spread over a number of years (NWCC, p. 25).

EXAMPLES

A model tax credit can be found at
http://www.awea.org/smallwind/toolbox/IMPROVE/incentives_3a.asp.

Examples of tax credits:

Hawaii
http://www.state.hi.us/tax/announce/2001ann16.htm.

Utah
http://www.nr.utah.gov/energy/credits.htm.

Idaho
http://www.ies.ncsu.edu/dsire/library/docs/incentives/ID01F.htm.

Investment Incentives (Grants/Rebates)

A direct cash payment gives wind project owners additional benefits compared to an equivalent-size tax incentive. First, the inability of some investors to absorb the full value of a tax credit is a substantial barrier to the effective use of tax incentives to support renewable energy development. A direct cash payment has no similar problems. Direct cash payments can be made even more powerful through cost-sharing, in which the government pays part of plant or wind system costs directly because the private investor would not pay taxes on the cost-shared portion.

Investment incentives are valuable in reducing the effective capital cost of renewable projects. Grants may be more appropriate for on- and off-grid, small-scale systems in which most of the power produced is used on-site. Compared with a yearly production incentive, a grant might be a more efficient support mechanism for small-scale wind installations, even those that are grid-connected (NWCC, pp. 45-46).

EXAMPLES

A model investment incentive can be found at http://www.awea.org/smallwind/toolbox/IMPROVE/incentives_3b.asp.

Example of an incentive in Illinois:
http://www.commerce.state.il.us/bus/gri/grants_energy.html.

Revolving Loan Funds

Debt costs significantly affect the levelized cost of energy from wind power systems. Smaller-scale (residential, agricultural, or commercial) renewable energy facilities can be affected even more than utility-scale projects by loan terms and conditions because of the higher installed cost per unit of capacity of smaller systems. Private bank loan terms and conditions for these smaller renewable facilities are likely to be even more costly and restrictive than for larger-scale systems.

State governments can provide low-cost capital to renewable energy projects to support their development. This can be done directly through a state agency or by making arrangements with private lending institutions, local authorities, or electric utilities. Direct loan programs have taken and can take many shapes, including economic development bonds, government and utility loans, community development programs, and green bonds. These programs can be used to support renewables by providing lower-cost debt than is available in the private markets (i.e., lower interest rates or terms that are more favorable). For smaller-scale systems, these programs also may reduce the transaction costs of arranging a private loan (SPO, p. 50).

EXAMPLES

A model of a revolving loan fund can be found at http://www.awea.org/smallwind/toolbox/IMPROVE/incentives_3c.asp.

Sales Tax Reductions

Reductions in state sales taxes can be used to support wind development by decreasing the tax burden (i.e., the tax payment per kWh of electric production) associated with owning a wind power facility. In general, due to their high capital costs and low operational costs, the per-kWh sales tax burden on renewable energy facilities is high relative to fossil-fuel-fired facilities. This is because the fossil fuel inputs to generation facilities generally are exempt from sales taxes, whereas sales tax is paid on wind turbines and other equipment. Sales tax incentives could be in the form of full exemptions or reductions in tax rates and could be applied to small-scale residential wind systems. By exempting renewable energy facilities from sales taxes or reducing the tax rates, the installed and levelized cost of wind power can be decreased. State legislatures have the authority to implement these policies. The enactment, implementation, and enforcement of such policies may occur independent of electric industry structure and regulation.

EXAMPLES

A model of a sales tax reduction can be found at http://www.awea.org/smallwind/toolbox/IMPROVE/incentives_3d.asp.

Examples of sales tax reductions:

Iowa
http://www.legis.state.ia.us/IACODE/2001/422/45.html.

Minnesota
http://www.commerce.state.mn.us/pages/Energy/ModTech/taxincentives.htm.

Property Tax Reductions

Reductions in property taxes can be used to support wind development by decreasing the tax burden (i.e., the tax payment per kWh of electric production) associated with owning a wind power facility. Property taxes can represent a more significant cost than sales taxes, depending on the relative tax rates and assessment methods. Property taxes could be in the form of full exemptions, reductions in tax rates, or changes in assessment methods, and they could be applied to small-scale residential wind systems. Property taxes typically are levied as a percentage of the assessed value of a facility or parcel, including improvements, and are set at the state or local level. Small wind systems are considered improvements. By reducing the property tax rate, altering the assessment method, or exempting a wind facility from property taxes (more applicable to utility-scale wind projects than to residential wind systems), wind costs can be significantly decreased, depending on the local tax rate. The enactment, implementation, and enforcement of this policy may occur independent of the electric industry structure and regulation (NWCC, pp.32-33).

A property tax reduction can help stimulate individual investment in small turbines (NWCC, Table 9, p. 34).

EXAMPLES

A model property tax reduction can be found at http://www.awea.org/smallwind/toolbox/IMPROVE/incentives_3e.asp.

Example of a property tax reduction in Illinois: http://www.ies.ncsu.edu/dsire/library/docs/incentives/IL01F.htm.

Reference

National Wind Coordinating Committee (NWCC). (1999). "Strategies for supporting wind energy: a review and analysis of state policy options." http://www.nationalwind.org/pubs/strategies/default.htm.